

ABSTRACT OF THE DISCLOSURE

A method of forming a non-volatile resistance variable device includes forming a first conductive electrode material on a substrate. A metal doped chalcogenide comprising material is formed over the first conductive electrode material. Such comprises the metal and A_xB_y , where "B" is selected from S, Se and Te and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table. In one aspect, the chalcogenide comprising material is exposed to and HNO_3 solution. In one aspect the outer surface is oxidized effective to form a layer comprising at least one of an oxide of "A" or an oxide of "B". In one aspect, a passivating material is formed over the metal doped chalcogenide comprising material. A second conductive electrode material is deposited, and a second conductive electrode material of the device is ultimately formed therefrom.

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